

REMARKS

The Office Action mailed November 30, 2007 has been carefully reviewed and the following remarks have been made in consequence thereof.

Claims 1, 3-6, 8-20 and 22 are now pending in this application. Claims 1-6, 21 and 22 are rejected. Claims 8-20 have been withdrawn from consideration. Claims 2, 7 and 21 have been canceled.

The rejection of Claim 21 under 35 U.S.C. § 112, second paragraph is respectfully traversed. Claim 21 has been cancelled. For the reasons set forth above, Applicants respectfully request that the Section 112 rejection of Claim 21 be withdrawn.

The rejection of Claims 1, 3-6 and 21 under 35 U.S.C. § 102(b) as being anticipated by Meier et al. (U.S. Patent No. 6,438,838) ("Meier") is respectfully traversed.

Meier describes a method for repairing a vane (5) for a turbine. The repair method includes severing and removing a damaged section (4') of vane (5) along a plane (12) such that a stub (13) is formed. During the repair process, an inductor (16) is coupled to a periphery (15) of stub (13) to heat and soften periphery (15). A replacement vane (20) that corresponds in shape and curvature to stub (13) is aligned and welded to stub (13) in a protective gas atmosphere using high-frequency welding. Specifically, when a high-frequency current is applied to inductor (16), the material of stub (13) and replacement vane (20) melts to enable replacement vane (20) and stub (13) to be bonded together. Notably, Meier does not describe nor suggest coupling, with resistance welding, a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material including at least one of a nickel alloy and a titanium alloy to form a single weld joint that extends along a cut line.

Claim 1 recites a method of replacing a portion of a gas turbine engine rotor blade that includes "cutting through the rotor blade such that a cut line extends from a leading edge of the blade to a trailing edge of the blade and between the first sidewall and the second sidewall, and such that the cut line extends at least partially through a hollow portion of the

blade defined between the first and second sidewalls . . . removing the portion of the rotor blade that is radially outward of the cut line . . . and coupling, with resistance welding, a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material including at least one of a nickel alloy and a titanium alloy to form a single weld joint extending along the cut line such that a newly formed rotor blade is formed with an aerodynamic contour that is one of an improvement in aerodynamic performance over the original blade contour and mirroring the original blade contour.”

Meier does not describe nor suggest a method of replacing a portion of a gas turbine engine damaged rotor blade as is recited in Claim 1. Specifically, Meier does not describe nor suggest coupling, with resistance welding, a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material including at least one of a nickel alloy and a titanium alloy to form a single weld joint extending along a cut line extending from a leading edge to a trailing edge of the blade. Rather, in contrast to the invention, Meier describes a method for repairing a damaged vane wherein a high-frequency current is applied to an inductor that melts and bonds the material of stub and replacement vane section together. Notably, Meier does not describe nor suggest resistance welding using a welding material that includes at least one of a nickel alloy and a titanium alloy.

Accordingly, for the reasons set forth above, Claim 1 is submitted to be patentable over Meier.

Claim 21 has been cancelled. Claims 3-6 depend from independent Claim 1. When the recitations of Claims 3-6 are considered in combination with the recitations of Claim 1, Applicants submit that Claims 3-6 likewise are patentable over Meier.

For at least the reasons set forth above, Applicants respectfully request that the Section 102 rejection of Claims 1, 3-6 and 21 be withdrawn.

The rejection of Claims 1, 3-6 and 21 under 35 U.S.C. § 103 as being unpatentable over Meier et al. (U.S. Patent No. 6,438,838) (“Meier”) in view of Wachtell et al. (U.S. Patent No. 3,650,635) (“Wachtell”) is respectfully traversed.

Meier is described above. Wachtell describes a method for repairing damaged or defective turbine guide vanes (21). A substantially-rectangular, longitudinal section of the vane including the defect (not shown) is cut from the vane (21) and removed. A substantially-rectangular, longitudinal insert (23) is welded to the vane (21) using either tungsten inert gas welding or electron beam welding to couple the replacement insert (23) to the remaining vane (21). The insert (23) includes columnar grains that extend along a trailing edge of the vane (21) such that grain boundaries are substantially eliminated normal to the edge of the insert (23). Notably, Wachtell does not describe nor suggest resistance welding using a welding material that includes at least one of a nickel alloy and a titanium alloy. Additionally, Wachtell does not describe nor suggest coupling, with resistance welding, a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material including at least one of a nickel alloy and a titanium alloy to form a single weld joint that extends along a cut line.

Claim 1 recites a method of replacing a portion of a gas turbine engine rotor blade that includes “cutting through the rotor blade such that a cut line extends from a leading edge of the blade to a trailing edge of the blade and between the first sidewall and the second sidewall, and such that the cut line extends at least partially through a hollow portion of the blade defined between the first and second sidewalls . . . removing the portion of the rotor blade that is radially outward of the cut line . . . and coupling, with resistance welding, a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material including at least one of a nickel alloy and a titanium alloy to form a single weld joint extending along the cut line such that a newly formed rotor blade is formed with an aerodynamic contour that is one of an improvement in aerodynamic performance over the original blade contour and mirroring the original blade contour.”

No combination of Meier and Wachtell describes nor suggests a method of replacing a portion of a gas turbine engine rotor blade as is recited in Claim 1. More specifically, no combination of Meier and Wachtell describes nor suggests coupling, with resistance welding, a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material including at least one of a nickel alloy and a titanium alloy to form a single

weld joint extending along a cut line extending from a leading edge to a trailing edge of the blade. Rather, in contrast to the invention, Meier describes a method for repairing a damaged vane wherein a high-frequency current is applied to an inductor that melts and bonds the material of stub and replacement vane section together, and Wachtell describes a method for replacing a longitudinal section of a turbine vane wherein a longitudinal insert is welded to the turbine vane using tungsten inert gas welding or electron beam welding. Notably, neither Meier nor Wachtell describes nor suggests resistance welding using a welding material that includes at least one of a nickel alloy and a titanium alloy. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Meier in view of Wachtell.

Further, it is impermissible to use the claimed invention as an instruction manual or “template” to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose among isolated disclosures in the art to deprecate the claimed invention. It appears that the present rejection reflects an impermissible attempt to use the instant claims as a guide or roadmap in formulating the rejection using impermissible hindsight reconstruction of the invention. The United States Supreme Court has recently expressed concern regarding distortion caused by hindsight bias in an obviousness analysis, and notes that factfinders should be cautious of arguments reliant upon ex post reasoning. See, KSR International Co. v. Teleflex, Inc., slip Opinion at page 17. The Supreme Court also explained that, following “common sense,” “familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” Id. at page 16. Applicants respectfully submit that the teachings of Meier and Wachtell do not fit together like pieces of a puzzle, but rather are two isolated disclosures, which have been chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

Claim 21 has been cancelled. Claims 3-6 depend from independent Claim 1. When the recitations of Claims 3-6 are considered in combination with the recitations of Claim 1,

Applicants submit that dependent Claims 3-6 likewise are patentable over Meier in view of Wachtell.

For at least the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claims 1, 3-6 and 21 be withdrawn.

The rejection of Claim 22 under 35 U.S.C. § 103 as being unpatentable over Meier in view of Wachtell and in further view of Dulaney et al. (U.S. Patent No. 6,238,187) (“Dulaney”) is respectfully traversed.

Meier and Wachtell are described above. Dulaney describes a method for repairing a damaged airfoil. The repair method includes removing (step 24) damaged portions or sections (12 and 16, for example) of airfoil (10) and replacing (step 26) these portions (12 and 16) with replacement pieces (44 and 46, for example). Replacement pieces (44 and 46) are integrally joined to airfoil (10) using a joining (step 28) operation to form a refurbished airfoil that includes a seam (78) defined between the airfoil (10) and the replacement piece (44 and 46). The refurbished airfoil is shaped (step 29) by removing the excess material from replacement piece (44 and 46) and seam (78) to return the joined airfoil to predetermined dimensional tolerances. A laser shock peening treatment (step 30) induces the formation of compressive residual stresses at the seam (78). Notably, Dulaney does not describe nor suggest resistance welding using a welding material that includes at least one of a nickel alloy and a titanium alloy. Additionally, Dulaney does not describe nor suggest coupling, with resistance welding, a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material including at least one of a nickel alloy and a titanium alloy to form a single weld joint extending along a cut line extending from a leading edge to a trailing edge of the blade.

Claim 22 depends directly from Claim 1, which recites a method of replacing a portion of a gas turbine engine rotor blade that includes “cutting through the rotor blade such that a cut line extends from a leading edge of the blade to a trailing edge of the blade and between the first sidewall and the second sidewall, and such that the cut line extends at least partially through a hollow portion of the blade defined between the first and second sidewalls

. . . removing the portion of the rotor blade that is radially outward of the cut line . . . and coupling, with resistance welding, a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material including at least one of a nickel alloy and a titanium alloy to form a single weld joint extending along the cut line such that a newly formed rotor blade is formed with an aerodynamic contour that is one of an improvement in aerodynamic performance over the original blade contour and mirroring the original blade contour.”

No combination of Meier, Wachtell and Dulaney describes nor suggests a method of replacing a portion of a gas turbine engine rotor blade as is recited in Claim 1. More specifically, no combination of Meier, Wachtell and Dulaney describes nor suggests coupling, with resistance welding, a replacement blade portion to a remaining blade portion with a single-pass weld using a welding material including at least one of a nickel alloy and a titanium alloy to form a single weld joint that extends along a cut line. Rather, in contrast to the invention, Meier describes a method for repairing a damaged vane wherein a high-frequency current is applied to an inductor that melts and bonds the material of stub and replacement vane section together, and Wachtell describes a method for replacing a longitudinal section of a turbine vane wherein a longitudinal insert is welded to the turbine vane using tungsten inert gas welding or electron beam welding. Dulaney describes a method of repairing a damaged airfoil that includes removing damaged portions of an airfoil and integrally replacing these portions with replacement pieces. The refurbished airfoil is then shaped by removing the excess material from the replacement piece to return the refurbished airfoil to within predetermined dimensional tolerances. Notably, no combination of Meier, Wachtell and Dulaney describes nor suggests resistance welding using a welding material that includes at least one of a nickel alloy and a titanium alloy. Accordingly, for at least the reasons set forth above, Claim 1 is submitted to be patentable over Meier in view of Wachtell and in further view of Dulaney.

Further, it is impermissible to use the claimed invention as an instruction manual or “template” to piece together the teachings of the cited art so that the claimed invention is rendered obvious. Specifically, one cannot use hindsight reconstruction to pick and choose

among isolated disclosures in the art to deprecate the claimed invention. It appears that the present rejection reflects an impermissible attempt to use the instant claims as a guide or roadmap in formulating the rejection using impermissible hindsight reconstruction of the invention. The United States Supreme Court has recently expressed concern regarding distortion caused by hindsight bias in an obviousness analysis, and notes that factfinders should be cautious of arguments reliant upon ex post reasoning. See, KSR International Co. v. Teleflex, Inc., slip Opinion at page 17. The Supreme Court also explained that, following “common sense,” “familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” Id. at page 16. Applicants respectfully submit that the teachings of Meicr, Wachtell and Dulaney do not fit together like pieces of a puzzle, but rather are three isolated disclosures, which have been chosen in an attempt to deprecate the present invention. Of course, such a combination is impermissible, and for this reason alone, Applicants request that the Section 103 rejection be withdrawn.

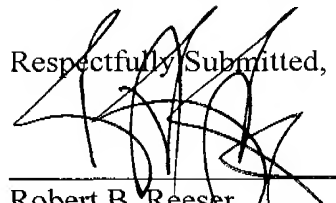
Claim 22 depends directly from independent Claim 1. When the recitations of Claim 22 are considered in combination with the recitations of Claim 1, Applicants submit that dependent Claim 22 likewise is patentable over Meier in view of Wachtell and in further view of Dulaney.

For the reasons set forth above, Applicants respectfully request that the Section 103 rejection of Claim 22 be withdrawn.

In view of the foregoing amendment and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Applicants do not believe any fees are due in connection with this amendment; however, the Commissioner is hereby authorized to charge any fees which may be required to Deposit Account No. 012384 in the name of ARMSTRONG TEASDALE LLP.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read 'R. B. Reeser', is written over a horizontal line.

Robert B. Reeser
Registration No. 45,548
ARMSTRONG TEASDALE LLP
One Metropolitan Square, Suite 2600
St. Louis, Missouri 63102-2740
(314) 621-5070